

MW & BC FUNDED RESEARCH PROJECTS/1987-88

By Title and Summary

TITLE: Infra-Red Reflectance Spectrometer - Standardization of a Near Infra-Red Reflectance Spectrometer and Modification of a Udy Cyclone Grinder for Use in Quality Enhancement Research Investigations of Small Grain Straws

INSTITUTION: Montana State University

DEPARTMENT: Eastern Agricultural Research Center/Sidney MT

RESEARCHERS: Jerald W. Bergman
Charles R. Flynn

COOPERATORS: Larry White, Southern Plains Range Research Station
Rene Panasuk, Lab Assistant

AMOUNT FUNDED: \$3,500

OBJECTIVES:

To obtain measurements of digestible drymatter values in a standard set of samples for the straws of barley, spring wheat, winter wheat, oats, and durum so that these in vitro values may be used to standardize a Technicon Infra-Alyzer-400 at the Eastern Agricultural Research Center at Sidney, Montana.

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TITLE: Two and Six Rowed Barley Cultivars -- Development of two and six rowed barley cultivars adapted to Montana.

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Tom Blake, Pat Hensleigh (Assistant)

AMOUNT FUNDED: \$50,000

OBJECTIVES:

Development of high yielding spring barley cultivars adapted to dryland, irrigated and recrop conditions in Montana.

Development of feed and malting barley cultivars with unique quality characteristics adapted to dryland and barley production. Evaluation of winter barley populations for hardiness and yield potential. Improved evaluation of barley cultivars and advanced lines across a wide array of yield levels.

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TITLE: Research Centers Cropping Systems -- Evaluation of various materials and practices contributing toward economic crop production under flexible, continuous and other cropping systems in Montana.

INSTITUTION: Montana State University

DEPARTMENT: Ag Research Centers

RESEARCHERS: Various

AMOUNT FUNDED: \$34,500.00

OBJECTIVES:

To evaluate the effects of differing systems on crop variety performance under the diverse environments represented across the Montana Research Center network. To evaluate the potential fit of other materials, concepts and techniques with various cropping systems employed.

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TITLE: New Virus-like Disease Barley -- Study of the new virus-like disease of barley.

INSTITUTION: Montana State University

DEPARTMENT: Plant Pathology

RESEARCHERS: Tom Carroll

PERSONNEL: N.L. Robertson

AMOUNT FUNDED: \$32,500

OBJECTIVES:

Establish that the disease is caused by a virus-like agent that is transmitted by the Brown Wheat Mite, as opposed to it being caused by mite feeding alone. Continue to work on the isolation, purification and characterization of the filamentous particles presumed to be the virus-like causal agent. Examine possible strategies for control of the disease.

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TITLE: Split Application of Nitrogen -- Response of dryland spring wheat to a split application of nitrogen.

INSTITUTION: Montana State University

DEPARTMENT: Eastern Agricultural Research Station/Sidney MT

RESEARCHERS: Joyce Eckhoff, Becky Dige, Rita Iverson

AMOUNT FUNDED: \$3,000.00

OBJECTIVES:

To determine if a split application of nitrogen can increase the protein content of dryland spring wheat in eastern Montana. To observe varietal differences to a split application of N under dryland conditions.

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TITLE: Value Enhancement of Barley -- Value Enhancement of Barley Through Coordinated Investigations of Factors Influencing Nutritional Qualities and Food Science Applications.

INSTITUTION: Montana State University

DEPARTMENT: Animal & Range Sciences/Plant & Soil Sciences

RESEARCHERS: C.W. Newman, D.G. Gray, C.F. McGuire, R.K. Newman
M.K. Petersen

COOPERATORS: E.A. Hockett, J. O'Palka, R.T. Ramage, V.M. Thomas

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AMOUNT FUNDED: \$92,160.00

OBJECTIVES:

To investigate the tissue and blood cholesterol lowering properties of selected barley cultivars using experimental animals, humans and in vitro chemical methods. To develop an improved method of extracting and purifying beta-glucans from barley cultivars and investigate the use of these products in food and medicinal products. To investigate the effects of processing on the nutritional quality of commercial barley cultivars and isogeneic lines known to vary in beta-glucans. To determine the effects of proanthocyanidins, free tannin and tannic acid on the value of barley for animal feed and human food products.

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TITLE: Spring Wheat Breeding and Genetics

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: E.A. Hockett
J. Bauder
Susan Lanning

AMOUNT FUNDED: \$80,000.00

OBJECTIVES:

To develop superior spring wheat varieties for Montana. To pursue genetic research on wheat adaptation to Montana. To improve end-product quality of spring wheat. To coordinate the spring wheat testing program for Montana.

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TITLE: Biological Control of Wheat-stem Sawfly --
Initial Investigations for Biological Control of
Wheat-stem Sawfly.

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INSTITUTION: Montana State University

DEPARTMENT: Entomology

RESEARCHERS: Michael Ivie

AMOUNT FUNDED: \$3,250.00

OBJECTIVES:

Identify geographic area of origin of the Wheat-stem Sawfly.
Gather initial data to assess potential for successful
biological control.

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TITLE: Brown Wheat Mite in Barley -- Investigations on
the biology and management of the brown wheat
mite, Petrobia latens (Muller), in barley in
north central Montana.

INSTITUTION: Montana State University

DEPARTMENT: Entomology

RESEARCHERS: Greg Johnson
Jack Riesselman
Donald Lester

AMOUNT FUNDED: \$8,150.00

OBJECTIVES:

Develop a sampling and counting method for estimating brown
wheat mite population densities and determining the efficacy of
selected miticides. Establish baseline data on the susceptibil-
ity of the brown wheat mite to currently registered miticides
through laboratory bioassays. Conduct miticide efficacy trials
using currently registered pesticides and different application
techniques. Develop treatment guidelines (economic thresholds)
based on mite densities, disease prevalence and environment
factors for future implementation. Study the relationship

between brown wheat mite densities and prevalence of the new virus-like disease.

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TITLE: Germ Plasm Resistance Stem and Stripe Rust --
Development of resistant germ plasm to stem and
stripe rust of wheat.

INSTITUTION: Montana State University

DEPARTMENT: Entomology

RESEARCHERS: Greg Johnson
Jack Riesselman
Donald Lester

AMOUNT FUNDED: \$20,000.00

OBJECTIVES:

Continuation of the cereal rusts program at Montana State University after the retirement of Dr. E.L. Sharp. Continue the search for new resistance sources to stem and stripe rust with major emphasis on durable resistance. Monitor virulence of fungal agents and determine any possible changes. Continue to evaluate various national and international stem and stripe rust nurseries to detect any possible new sources of resistance. Develop simple screening methods to recognize quantitative durable resistance (e.g. latent period in slow rusters.) Maintain inoculum and establish rust nurseries for the wheat breeding program.

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TITLE: Economic Control Cephalosporium Stripe -- The
Economic Control of Cephalosporium Stripe in
Winter Wheat.

INSTITUTION: Montana State University

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DEPARTMENT: Agricultural Economics & Economics

RESEARCHERS: Jeffrey T. LaFrance
Don Mathre
Joan Danielson

AMOUNT FUNDED: \$12,500.00

OBJECTIVES:

To estimate the relationship between crop rotations and infection levels of Cephalosporium Stripe in winter wheat. To estimate the relationship between winter wheat yields and CS infection levels for winter wheat crops planted after a year of fallow and after a nonhost spring crop. To develop a dynamic programming model employing the relationships obtained from 1 and 2 above to analyze the economically optimal crop rotation strategies for controlling CS in winter wheat.

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TITLE: Sweet Wheat Project

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Allan Taylor
David C. Sands
Jerry Harris
Alice Pilgeram

AMOUNT FUNDED: \$6,000.00

OBJECTIVES:

Development of naturally sweet Montana grain products.

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TITLE: The Chickbar Project

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences/Animal & Ranges Sciences

RESEARCHERS: David Sands
Charles McGuire
Eugene Hockett
C.W. Newman

AMOUNT FUNDED: \$2,500.00

OBJECTIVES:
Development of barley lines designed to meet the requirements of poultry.

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TITLE: Middle and Far East Market Hard White Wheat --
Market development in Middle East and Far East
countries for Montana Hard White Wheat.

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Allan Taylor
Charles McGuire
Gail Cramer
Jacquelynn O'Palka

AMOUNT FUNDED: \$13,374.00

OBJECTIVES:
Submit samples of hard white wheat to testing laboratories in
target countries. Assess target country evaluations of Montana
grown hard white wheat in traditional end-uses. Increase seed
of MSU-MAES hard white wheats so commercial lots (20-20 tons)

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will be available for shipment in fall of 1988. Formulate
continuing plans beyond 1987-88.

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TITLE: Winter Wheat Improvement

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Allan Taylor
Ted Kisha

COOPERATORS: MAES Research Center, Charles McGuire, Jarvis
Brown, Jack martin, Ralph Olsen, Bill Inskeep,
Hayden Ferguson, Dick Lund

AMOUNT FUNDED: \$42,000.00

OBJECTIVES:
General support of winter wheat breeding project. Continue to
develop winter wheat varieties which stabilize and/or reduce
grower production cost.

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TITLE: Potentials of Montana Soils

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Science

RESEARCHERS: Gerald A. Nielsen, Clifford Montagne

COOPERATORS: Jim Bauder, Joe Caprio, Gregg Carlson, Peter Fay,
Hayden Ferguson, Jeff Jacobsen, Bill Larson, Dick
Lund, Bill Quimby, Earl Skogley, Steve Stauber,
Allan Taylor, John Taylor, Dave Tyler, John
Wilson

AMOUNT FUNDED:

OBJECTIVES:

The General goal of this project is to 1) acquire and organize knowledge needed for geographic information systems and new management procedures that make Montana agriculture competitive and sustainable; 2) Develop state, county, and farm level systems that extend